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(54) Dispensing escapement device

(57) An escapement device for the high-speed separation of piled blister panels (1) comprises a magazine (2) in which the panels are piled, a plurality of supporting needle-shaped upper and lower rests (5*a*, 5*b*) at the bottom of the magazine (2) moved by a drive (6*a*, 6*b*) between panel support position in which each panel is supported by the upper rests (5*a*) and a panel releasing position in which each panel is supported by the lower rests (5*b*) for the discharging onto a removing belt (4).

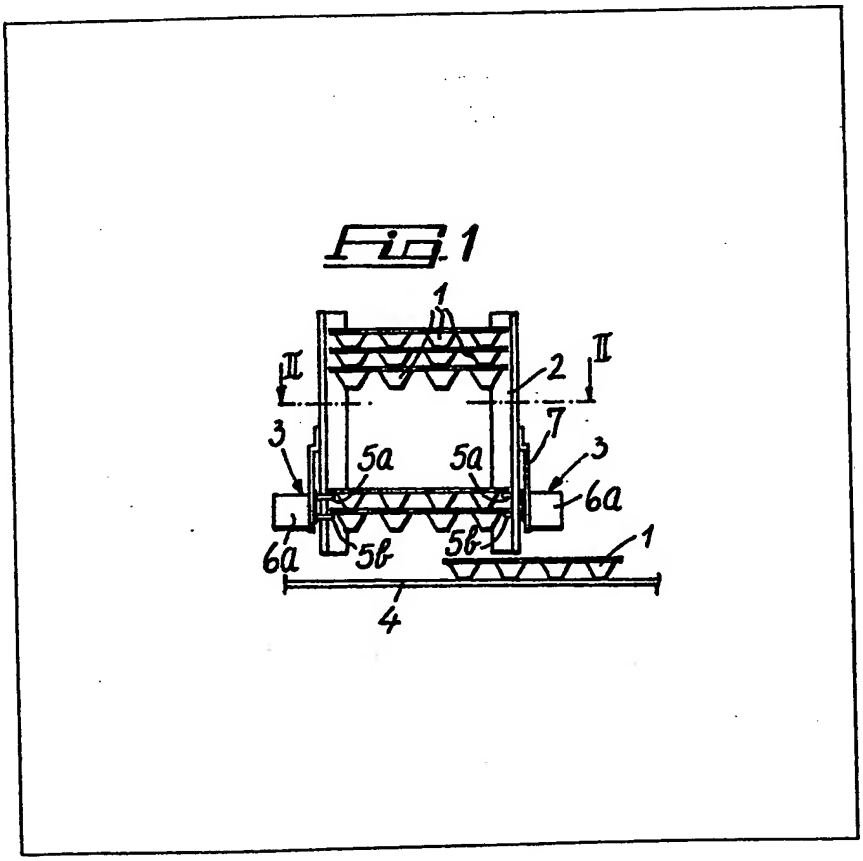

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Fig. 1

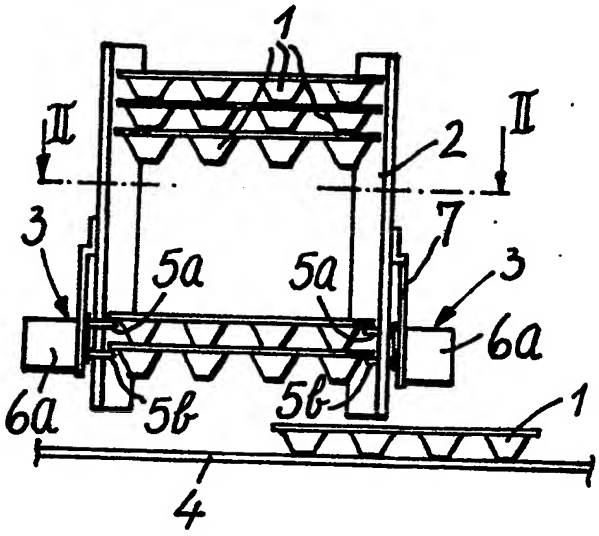


Fig. 2

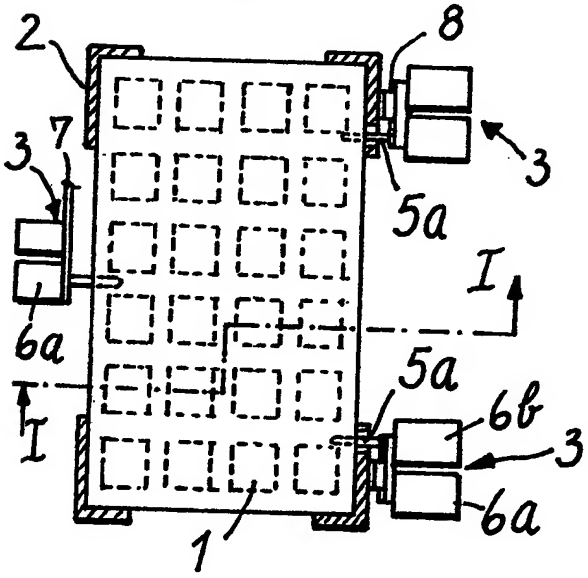


Fig. 3

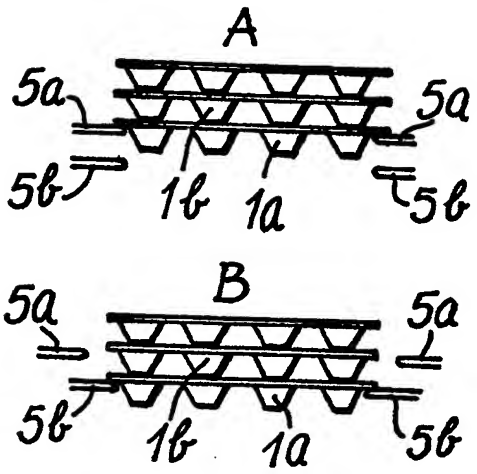
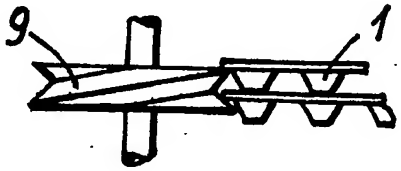


Fig. 4



SPECIFICATION

Escapement device for the individual high-speed separation of panels of blister or strip type and similiar products, piled in a magazine

This invention relates to an escapement device for the individual high-speed separation of panels of blister or strip type and similiar products, piled in a magazine. Tablets, pills and the like, especially of pharmaceutical type, are sold commercially in packages known as blisters or strips. The former consists of a plastic sheet in which seats for the tablets are formed in a uniform arrangement and are closed by aluminium foil. Strips, on the other hand, are formed from two aluminium foils disposed one on the other, with the tablets incapsulated between them. These packages are then cut to form panels for insertion in a predetermined number in boxes. At the present time, these panels are piled in a vertical magazine, and are fed to packaging machines by a belt provided with separating rods and/or pushers which withdraw a certain number of panels from the magazine.Known withdrawal devices have serious drawbacks, of which an important one is the withdrawal of the wrong number of panels, for example because the panels curve under the action of the weight of the pile. Moreover, it is difficult to vary the number of panels to be withdrawn by each pusher because of the bouncing which occurs when the panels fall on to the belt, so causing loss of exact positioning.

Furthermore, known devices are not suitable for satisfying the high operating speeds of present-day packaging machines.

The object of the present invention is therefore to provide a device for separating individual panels and for depositing them in an ordered manner on a packaging machine feed belt.

This object is attained by an escapement device, characterized in that it comprises at least three supports disposed at the bottom of the magazine and each composed of two overlying rests, the upper of which form a surface lying above and parallel to the surface formed by the lower rests, said rests being moved by drive means between a panel support position and a panel release position so that in a first position the upper rests support the lower panel of the pile, in a second position the upper rests are retracted to allow said panel to be deposited on the lower rests, in a third position the upper rests support the immediately overlying panel of the pile, and in a fourth position the lower rests are retracted to deposit the panel supported thereon, on to means for its removal.

Further details will be more apparent from the description given hereinafter of one preferred embodiment of the device according to the invention, illustrated by way of example in the accompanying drawing in which:

Figure 1 is a diagrammatic elevation on the line I—I of Figure 2;

Figure 2 is a plan view on the line II—II of Figure 1;

Figure 3 shows operating sequences for the device according to the invention, and

Figure 4 shows one modification of the device.

With reference to Figures 1 to 3, known blister panels 1 are shown piled in a magazine 2 of vertical axis, formed substantially by four angle sections disposed at the vertices of a quadrilateral having the dimensions of the panels 1 and lying above a removal belt 4.

The pile of panels 1 is supported lowerly by three supports 3, each constituted by an upper rest 5*a* and a lower rest 5*b* which are spaced apart by a distance slightly less than the thichness of the panels 1. The three upper and lower rests are disposed mutually coplanar at the vertices of a triangle, so that they engage under two parallel opposing edges of the panels. Each rest 5*a*, 5*b* comprises a type of needle of horizontal axis for insertion under the adjacent edge of a blister through a corresponding aperture in the magazine 2. The rests 5*a*, 5*b* are driven by respective electromagnets 6*a*, 6*b* fixed by brackets 7 to the magazine 2, and aranged to move the rests into engagement and disengagement with the relative panel 1. For reasons of size, because of the proximity of the two rests 5*a*, 5*b*, the upper one is connected to the rod of the relative electromagnet 6*a* by a plate 8.

The operation of the described device is as follows. In a first position, indicated by A in Figure 3, the upper rests 5*a* of the supports 3 support the lower panel 1*a* of the pile contained in the magazine. In a second position B, the upper rests 5*a* are simultaneously retracted by activating the respective electromagnets 6*a*, so that the entire pile is lowered onto the lower rests 5*b*. In a third position C, the upper rests 5*a* are again moved into the forward position to engage under the edges of a panel 1*b* lying immediately above the lower panel 1*a*. Finally, in a fourth position D, the rests 5*b* are retracted by the electromagnets 6*b* so that the panel 1*a* can fall on to the remocal belt 4, while the rest of the pile remains supported by the upper rests 5*a*. The rests 5*b* are again moved forward to reassume position A.

It should be noted that the individual panels can be separated at high speed by the described device.

The separation speed is easily adjusted by increasing or reducing the frequency of operation of the electromagnets. In addition, by increasing the distance between the upper supports 5*a* and the lower supports 5*b*, the number of panels released on to the belt 4 can be varied.

In a second embodiment shown in Figure 4, each support is constituted by a disc 9 provided with a screw thread along its outer periphery to form the rests for the panel. The disc is rotated to enable the panels to fall on to the belt 4 as soon as they reach the end of the thread.

The device according to the invention also enables the products unloaded on to the belt 4 to be counted.

CLAIMS

1. An escapement device for the individual high-speed separation of panels of blister or strip type and similar products, piled in a magazine, characterized in that it comprises three supports disposed at the bottom of the magazine and each composed of two overlying rests, the upper of which form a surface lying above and parallel to the surface formed by the lower rests, said rests being moved by drive means between a panel support position and a panel release position so that in a first position the upper rests support the lower panel of the pile, in a second position the upper rests are retracted to allow said panel to be deposited on the lower rests, in a third position the upper rests support the immediately over-lying panel of the pile, and in a fourth position the lower rests are retracted to deposit the panel supported thereon, on to means for its removal.

2. A device as claimed in claim 1, wherein each of said rests is constituted by a sort of needle disposed with its axis horizontal and moved between the support position and the release position by an electromagnet.

3. A device as claimed in claim 1, wherein each of said supports is constituted by a disc provided along its outer periphery with a screw thread on which the panel edges rest, said disc being rotatable about an axis parallel to the panel pile axis.

4. An escapement device for the individual high-speed separation of panels of blister or strip type and similar products, piled in a magazine substantially as herein described with reference to the accompanying drawings.

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